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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
PAK, HANNAH J	

ART UNIT	PAPER NUMBER
1796	

NOTIFICATION DATE	DELIVERY MODE
10/01/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/506,992	UDAGAWA ET AL.	
	Examiner	Art Unit	
	Hannah Pak	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 March 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-11 and 13-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-2, 4-11, and 13-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application.
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 03/25/2010 has been entered.

Response to Amendment

2. The applicants added a new limitation in claim 1 for the first time in prosecution. Written descriptive support for such limitation is found at page 82, line 5 and also page 43, lines 1-15 of the specification as originally filed.

3. The previous rejections are withdrawn in light of applicant's amendment filed on 03/24/2010, along with a request for continued examination under 37 CFR 1.114. In view of such amendment, new ground(s) of rejections over new prior art are set forth below.

Claim Objections

4. Claim 1 objected to because of the following informalities: Place a space between "5" and "mm" recited in claim 1. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-2 and 4-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Konno et al. (WO 02/20655, but rely on US 2004/0030027 as an English equivalent)

Like the applicants, Konno et al. disclose a diene-based-rubber inorganic compound composite material and a method of producing the same (Paragraph 14). Specifically, the method comprises a step of mixing an aqueous dispersion of a diene-based rubber, such as those having a polar group (e.g., hydroxyl group), with at least one inorganic compound having the following formula:

$$wM \cdot xSiO_y \cdot zH_2O$$

wherein M is a metal selected from the group consisting of Al, Mg, Ti, and Ca, metal oxide or metal hydroxide, w is an number of 1-5, x is an integer of 0-10, y is an integer of 2-5, and z is an integer of 0-10, a material capable of forming the inorganic compound, such as oxoacid salts of metals, and anionic surfactant, such as rosin acid salt and lauric acid (Compare Paragraphs 14-15, 22, 28, and 46 of Konno et al. with claims 1-2, 4-5, 7-8 and 10 of the instant application). Other inorganic compounds used can include those having the structure $Al_2O_3.mSiO_2.nH_2O$, wherein m and n are an integer from 0-4 (Compare paragraphs 55-56 of Konno et al. with claim 9 of the instant application). Konno et al. further disclose the step of coagulating the diene-based

rubber and the inorganic compound with an electrolyte containing a metal salt, filtering and drying (Compare Paragraph 74 and see Claim 30 of Konno et al. with claim 6 of the instant application).

As to the claimed particle size, page 25 of the present specification describes a coagulation method for recovering the claimed composite. From this disclosure, it would appear that such a method would affect the composite particle size. Given that, the temperature and pH conditions in the present specification, namely 10 degrees Celsius or higher and pH of 2-14, are also the same as the corresponding temperature and pH conditions disclosed in paragraph 74 of Konno et al. Therefore, given the exact overlap in coagulation method conditions, there is a reasonable expectation that Konno et al.'s process would yield a composite having the same particle size as that recited in instant claim 1, see MPEP § 2112, III.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-2, 4-11, and 13-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Konno et al. (WO 02/20655, but rely on US 2004/0030027 as an English equivalent) with Gorl et al. (US 6,433,064).

The disclosure with respect to Konno et al. in paragraph 5 is incorporated here by reference.

To the extent Konno et al. do not inherently produce its rubber-inorganic composite material in the claimed particle diameter, Gorl et al. teach a powdered rubber material having a particle size of 0.05-10 mm, which are said to be useful for producing rubber products and rubber applications (Col. 1, lines 5-10 and Col. 2, lines 35-37).

Given that Konno et al. teach using their rubber-inorganic composite material to make rubber articles (products), it would have been obvious to one of ordinary skill in the art to produce the rubber-inorganic composite material of Konno et al. in the particle size (e.g., 0.05-10 mm) suitable for making rubber articles (products) as taught by Gorl et al.

As to claim 13, Konno et al. teach a step of mixing aluminum-containing suspension whose pH is controlled in a range of 2-14 (Paragraph 74), which overlaps with the claimed pH range of 5.1-8.4. Therefore, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made since it has been held that choosing the over lapping portion of the range taught by Konno et al. and the range claimed by the applicant, has been held to be a *prima facie* case of obviousness, *see MPEP § 2144.05*.

7. Claims 1-2, 4-11, and 13-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Branlard et al. (US 4,189,567) in view of Kondo et al. (US 2002/01156169).

Branlard et al. disclose a process for preparing powdered rubber composition involving the step of mixing an aqueous emulsion of latexes, such as homopolymers of butadiene, in the presence of surfactants containing fatty acids, and other ingredients, such as fillers (Col. 1, lines 5-25 and Col. 7, lines 30-40). Branlard et al. further disclose flocculating (or coagulating) the resulting mixture with the aid of a metal salt, e.g., aluminum polyhydroxychlorides, separating the coagulation product by filtration, and and then drying the coagulated product (Col. 2, lines 2-54 and Col. 3, lines 50-60).

Although Branlard et al. broadly mention using fillers, they do not specify such fillers as those defined by the formulae recited in claims 1 and 9.

Kondo et al. teach employing inorganic filler represented by the following formula:

$$mM_xSiO_y \cdot zH_2O$$

wherein M is a metal selected from the group consisting of Al, Mg, Ti, and Ca, metal oxide or metal hydroxide, m is an integer of 1-5, x is an integer of 0-10, y is an integer of 2-5, and z is an integer of 0-10, mixed with a diene rubber, such as styrene butadiene rubber, and anionic surfactant, such as rosin acid salt and lauric acid, to provide a rubber composition with excellent fracture properties and wear resistance (Paragraphs 1, 16-17, 51 and 56). Other fillers used can include pyrophyllite having the structure

$Al_2O_3.4SiO_2.H_2O$ and betonite having the structure $Al_2O_3.4SiO_2.2H_2O$ (Paragraph 22), corresponding to those recited in claim 9 when m is 4 and n is 1 or 2.

Given the above teachings, it would have been obvious to one of ordinary skill in the art to use the specific fillers defined by the claimed formulae of Kondo et al. as the fillers in the rubber composition of the type taught by Branlard et al. with a reasonable expectation of successfully providing desired properties, e.g., excellent fracture properties and wear resistance.

As to claim 1, Branlard et al. teach the powdered rubber having a particle size of 0.1-5 mm (Col. 3, lines 5-10), which touches the claimed range of 5 mm or more. Therefore, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made since it has been held that choosing the over lapping portion of the range taught by Branlard et al. and the range claimed by the applicant, has been held to be a *prima facie* case of obviousness, *see MPEP § 2144.05*.

As to claims 7 and 8, although Branlard et al. teach using mixtures of latexes, such as polybutadiene, they do not specifically mention using those having a polar group. Kondo et al. teach using diene rubber having a polar group, such as a carboxyl or hydroxyl groups, for the purpose of forming rubber composition having advantageous properties, such as excellent fracture properties and wear resistance (Paragraphs 2 and 31). Thus, it would have been obvious to one of ordinary skill in the art to employ the diene rubbers having the polar groups of Kondo et al. together with the other diene

rubbers in the rubber composition of the type taught by Branlard et al. to obtain desired fracture and wear resistant properties.

8. Claims 1-2, 4-5, and 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gorl et al. (US 6,433,064) or Smigerski et al. (US 4,883,829) in view of Kondo et al. (US 2002/01156169).

Gorl et al. disclose a process for producing a rubber powder composition involving among other things, the step of mixing an aqueous emulsion of a rubber solution containing, for example, styrene butadiene rubber, together with inorganic fillers, anionic surfactants, and metal salts, such as aluminum chloride (Col. 4, lines 50-65, Col. 6, lines 10-20 and Col. 7, lines 40-45).

Alternatively, Smigerski et al. teach preparing powdered rubber by mixing rubber emulsions containing, for example, polybutadienes or copolymers of butadiene and styrene, with filler and a metal salt (Col. 2, lines 45-60 and Col. 3, lines 35-45).

Although Gorl et al. and Smigerski et al. broadly mention using filler, neither reference specifies such fillers as those defined by the formula recited in claims 1 and 9.

Kondo et al. teach employing inorganic filler represented by the following formula:

$$mM_xSiO_y \cdot zH_2O$$

wherein M is a metal selected from the group consisting of Al, Mg, Ti, and Ca, metal oxide or metal hydroxide, m is an integer of 1-5, x is an integer of 0-10, y is an integer of 2-5, and z is an integer of 0-10, mixed with a diene rubber, such as styrene butadiene

rubber, and anionic surfactant, such as rosin acid salt and lauric acid, to provide a rubber composition with excellent fracture properties and wear resistance (Paragraphs 1, 16-17, 51 and 56). Other fillers used can include pyrophyllite having the structure $Al_2O_3.4SiO_2.H_2O$ and betonite having the structure $Al_2O_3.4SiO_2.2H_2O$ (Paragraph 22), corresponding to those recited in claim 9 when m is 4 and n is 1 or 2.

Given the above teachings, it would have been obvious to one of ordinary skill in the art to use the specific fillers defined by the claimed formulae of Kondo et al. as the fillers in the rubber composition of the type taught by Gorl et al. or Smigerski et al. with a reasonable expectation of successfully providing desired properties, e.g., excellent fracture properties and wear resistance.

As to claim 1, Gorl et al. disclose the rubber powder having a particle size of 0.5-10 mm (Col. 2, lines 35-40), which overlaps with that claimed, i.e., 5 mm or more. Moreover, Smigerski et al. disclose the powered rubber having a particle size of less than 10 mm (Col. 4, lines 39-42), which overlaps with that claimed, i.e., 5 mm or more. Therefore, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made since it has been held that choosing the over lapping portion of the ranges taught by Gorl et al. or Smigerski et al. and the range claimed by the applicant, has been held to be a *prima facie* case of obviousness, *see MPEP § 2144.05*.

As to claims 7 and 8, Gorl et al. and Smigerski et al. teach using diene rubbers do not specifically mention using other types of diene rubbers, such as those with a polar group. However, Kondo et al. teach using diene rubber having a polar group,

such as a carboxyl or hydroxyl groups, for the purpose of forming rubber composition having advantageous properties, such as excellent fracture properties and wear resistance (Paragraphs 2 and 31). Thus, it would have been obvious to one of ordinary skill in the art to employ the diene rubbers having the polar groups of Kondo et al. as the diene rubbers in the rubber composition of the type taught by Gorl et al. or Smigerski et al. to obtain desired fracture and wear resistant properties.

9. Claims 1-2, 4-5, and 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo et al. (US 2002/0156169) in view of Gorl et al. (US 6,433,064).

Kondo et al. teach a rubber composition prepared by mixing a rubber component, such as diene-based rubber having a polar group (e.g., hydroxyl group) with an inorganic filler represented by the following formula:

$$mM_xSiO_y \cdot zH_2O$$

wherein M is a metal selected from the group consisting of Al, Mg, Ti, and Ca, metal oxide or metal hydroxide, m is an integer of 1-5, x is an integer of 0-10, y is an integer of 2-5, and z is an integer of 0-10 and anionic surfactant, such as rosin acid salt and lauric acid, to provide a rubber composition with excellent fracture properties and wear resistance (Paragraphs 1, 16-17, 51 and 56). Other fillers used can include pyrophyllite having the structure $Al_2O_3.4SiO_2.H_2O$ and betonite having the structure $Al_2O_3.4SiO_2.2H_2O$ (Paragraph 22), corresponding to those recited in claim 9 when m is 4 and n is 1 or 2.

Kondo et al. do not specifically mention the particle size of their rubber-inorganic material. However, Gorl et al. teach a rubber material having a particle size of 0.05-10 mm, which are useful for producing rubber products and rubber applications (Col. 1, lines 5-10 and Col. 2, lines 35-37). Given that Kondo et al. teach using their rubber-inorganic composite material to make rubber articles (products), it would have been obvious to one of ordinary skill in the art to produce the rubber-inorganic composite material of Kondo et al. in the particle size (e.g., 0.05-10 mm) suitable for making rubber articles (products) as taught by Gorl et al.

Response to Arguments

10. Applicant's arguments with respect to claims 1-2, 4-11, and 13-19 have been considered but are moot in view of the new ground(s) of rejections.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hannah Pak whose telephone number is (571) 270-5456. The examiner can normally be reached on Monday - alternating Fridays (7:30 am - 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Hannah Pak
Examiner
Art Unit 1796

/HP/

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